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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/737,136	12/15/2003	Michael H. Eiselt	IVPD-0059	6345

7590 11/29/2006

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EXAMINER	
GARCIA, LUIS	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

31

Office Action Summary	Application No.	Applicant(s)
	10/737,136	EISELT ET AL.
	Examiner	**Art Unit**
	Luis F. Garcia	2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17, 19-51* is/are pending in the application.

4a) Of the above claim(s) *35-48* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17, 19-34 and 49-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. **Claims 1-17 and 19-51 are pending instant application.**

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-17, 19-34 and 49-51, drawn to an Inline Optical Amplifier Station, classified in class 398, subclass 173.

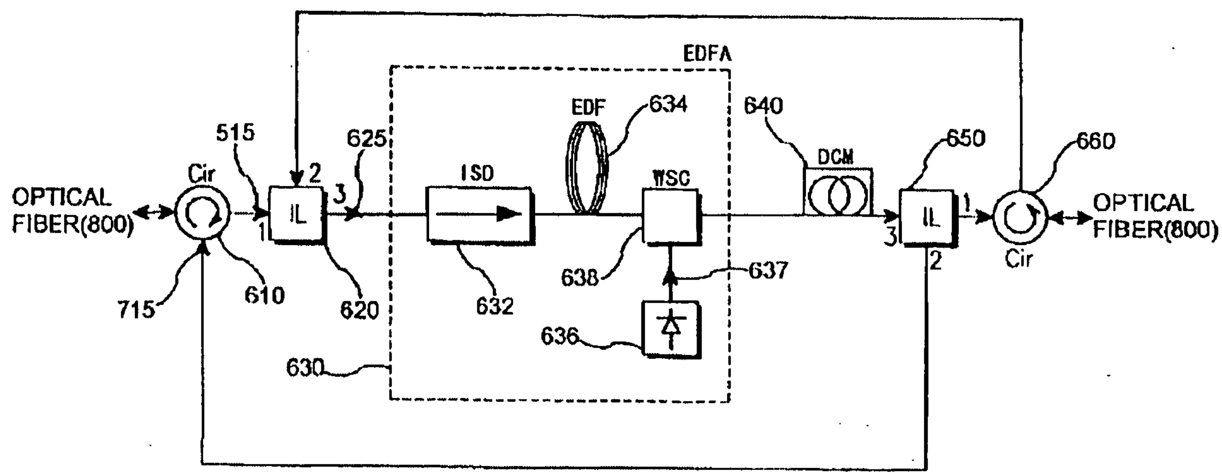
II. Claims 35-48, drawn to a Method of correction for dispersion of the spans, classified in class 398, subclass 159.

The inventions are distinct, each from the other because of the following reasons: as evidence as being distinct they belong in different classifications in the art.

During a telephone conversation with Applicant's Attorney Joseph Oriti on 11/11 a provisional election was made with traverse to prosecute the invention of Group 1, claims 1-17, 19-34 and 49-51. Affirmation of this election must be made by applicant in replying to this Office action. Claims 35-48 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

3. **Claims 1-9, 11, 15, 19-34 and 49-51 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Joo et al (US 6,888,671) in view of Spock et al (US 2002/0141048).



Joo FIG. 6

Regarding claim 1, Joo discloses an inline optical amplifier station for an optical system transporting at least one bidirectional optical signal **(FIG. 6)**, the inline optical amplifier station comprising:

a first optical coupler/decoupler for separating from a first bidirectional signal, a first signal bound in a first direction **(FIG. 6 (610-optical circulator, 515-forward optical signal) in which the circulator (optical coupler/decoupler) separates a first bidirectional signal bound in a first direction (e.g. forward optical signal), e.g. separates optical signal traveling to the right-515)**, and for combining a second signal bound in a second direction into the first bidirectional signal **(FIG. 6 (610-optical**

coupler, 715-reverse optical signal) in which the coupler combines a second signal (e.g. reverse optical signal) into the first bidirectional signal (e.g. to optical fiber 800));

a second optical coupler/decoupler for separating from a second bidirectional signal, a third signal bound in the second direction **(FIG. 6 (660-optical circulator) in which the optical circulator separates from a second bidirectional signal (e.g. optical signal from 800) a third signal bound in a second direction (e.g. output from top port of circulator-660))**, and for combining a fourth signal bound in the first direction into the second bidirectional signal **(FIG. 6 (660-optical circulator) in which the circulator combines a fourth signal (e.g. from port 1 of component-650) into the second bidirectional signal (e.g. output onto fiber 800))**;

the optical coupler operatively connected to an optical amplifier **(FIG. 6 (620-interleaver) in which the interleaver is connected to an optical amplifier (EDFA))**, the optical amplifier for converting the combined signal into an combined amplified signal **(FIG. 6 (EDFA) in which EDFA converts the combined signal (625) into a combined optical signal)**; and

the optical amplifier operatively connected to an optical decoupler for decoupling the combined amplified signal into the fourth signal and the second signal **(FIG. 6 (650-interleaver) in which the interleaver (optical decoupler) decouples the combined amplified signal into the fourth signal (e.g. output port 1 of interleaver) and the second signal (e.g. output port 2 of interleaver))**.

Joo does not expressly disclose a first optical attenuator connected to the first signal and to an optical coupler; a second optical attenuator connected to the third signal and to the optical coupler, the optical coupler for combining the first signal with the third signal into a combined signal;

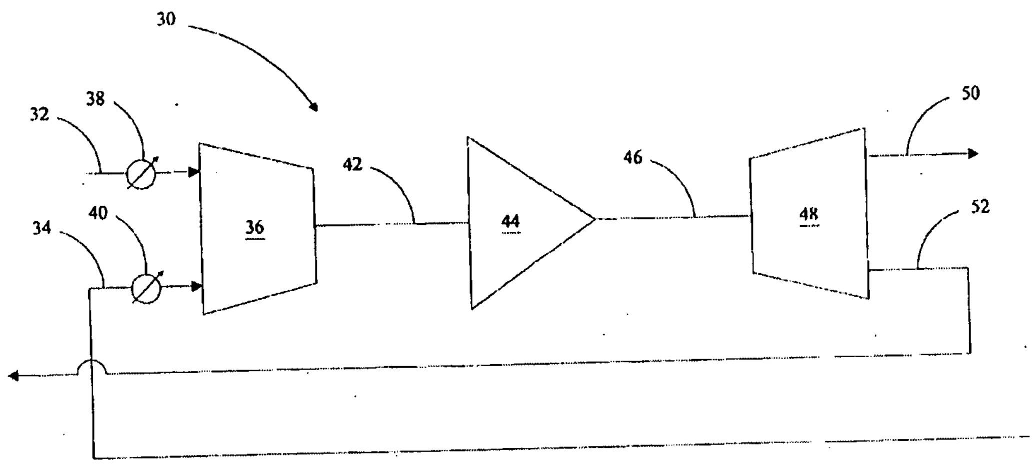


FIG. 2

Spock FIG. 2

Spock teaches a first optical attenuator connected to the first signal and to an optical coupler **(FIG. 2 (36-first interleaver) in which the first optical attenuator and the first input fiber are connected to the first interleaver)**;

a second optical attenuator connected to the third signal and to the optical coupler, the optical coupler for combining the first signal with the third signal into a combined signal **(FIG. 2 (36-interleaver, 40-varible optical attenuator, 34-second input fiber) in which the variable optical attenuator (second optical attenuator) is connected to the second input fiber (third signal) and an optical coupler (e.g.**

interleaver) combines the first signal with the third signal into a combined signal (42));

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo and incorporate Spock's teaching of using an optical attenuator in an inline optical amplifier station. The motivation being that this allows the system to dynamically control the power of each signal; thereby, allowing for dynamic gain adjustment as taught by Spock ¶0053.

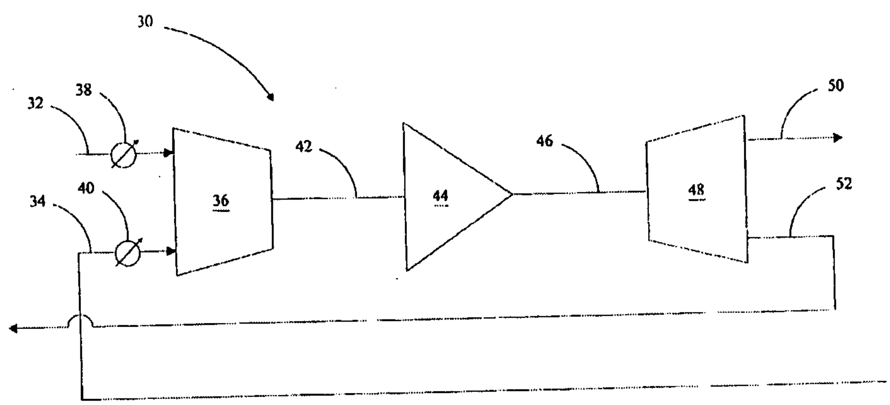


FIG. 2

Spock FIG. 2

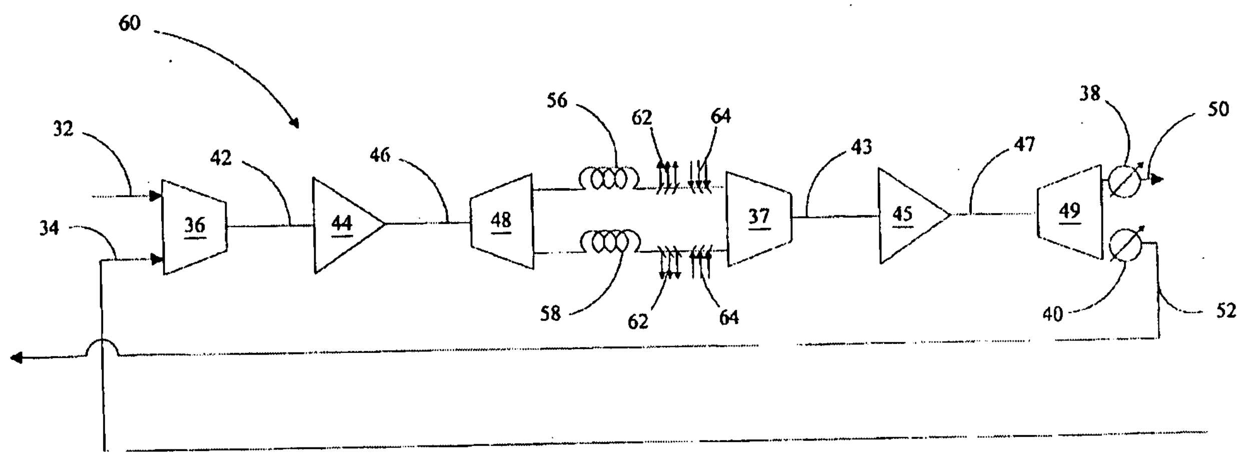


FIG. 4

Spock FIG. 4

<u>Regarding claim 2</u>, Joo in view of Spock disclose the inline optical amplifier station of claim 1 as applied above.

Joo does not expressly disclose wherein the optical amplifier comprises a multistage amplifier.

However, it is a matter of design choice as to what kind of amplifier Joo incorporates in FIG. 6 (EDFA). For a multi-stage optical amplifier is within the scope of Joo's invention.

Furthermore, Spock teaches wherein the optical amplifier comprises a multistage amplifier **(FIG. 2 (30-optical amplifier node)/FIG. 4 (60-optical amplifier node, multistage amplifier- 44, 45) and ¶0028,0044 in which a different embodiment of a**

single stage amplifier node (e.g. FIG. 2) is a multi-stage optical amplifier node (e.g. FIG. 4)).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo's amplifier stage and incorporate Spock's teachings of a multistage amplifier. The motivation being that this ensures the optical signal is amplified to the appropriate level via dual stage amplification; thereby, allowing the system to operate at an optimum gain/power level. NOTE: Spock teaches different embodiments of an optical amplifier node including a single stage implementation (FIG. 2) and a multi-stage configuration (FIG. 4).

Regarding claim 3, Joo in view of Spock disclose the inline optical amplifier station of claim 1 as applied above.

Joo does not expressly disclose wherein the optical amplifier further comprises a first stage producing an intermediate combined amplified signal connected to a second stage producing the combined amplified signal.

Spock teaches wherein the optical amplifier further comprises a first stage producing an intermediate combined amplified signal connected to a second stage producing the combined amplified signal **(FIG. 4 (44-first amplifier, 45-second amplifier) in which the first amplifier (first stage) produces an intermediate combined amplified signal connected to the second amplifier (second stage) producing the combined amplifier signal)**.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo's amplifier stage and incorporate Spock's teachings of a

multistage amplifier with a first and second stage. The motivation being that this ensures the optical signal is amplified to the appropriate level via dual stage amplification; thereby, allowing the system to operate at an optimum gain/power level. NOTE: Spock teaches different embodiments of an optical amplifier node including a single stage implementation (FIG. 2) and a multi-stage configuration (FIG. 4).

Regarding claim 4, Joo in view of Spock discloses the inline optical amplifier station of claim 3 as applied above.

Joo does not expressly disclose wherein a third variable optical attenuator is operatively connected between the first stage and the second stage.

Spock teaches wherein a third variable optical attenuator is operatively connected between the first stage and the second stage **(¶0033, 0039 in which Spock teaches that the optical attenuators can be placed in a varied of locations, e.g. on either side of the dispersion compensators (third optical attenuator on either side dispersion compensators (56,58) located between first and second stages (FIG. 4 (44,45)).**

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo's amplifier stage and incorporate Spock's teachings of a third variable optical attenuator. The motivation being that this allows optimum control of the optical power within the first and second amplifying stages; thereby, ensuring that the system is operating at an optimum level.

Regarding claims 5 and 6, rejected as stated in claim 4 rejection in which the dispersion compensators are located between the first and second stages.

Regarding claim 7, Joo in view of Spock disclose the inline optical amplifier station of claim 1 as applied above.

Joo further discloses wherein the fourth signal and the second signal comprise different wavelengths in two separate bands **(col3 ln1-32 in which the forward optical signal (fourth signal) and the reverse optical signal (second signal) comprise different wavelengths in to separate bands, e.g. forward optical signal ranges from 1,532 nm to 1,542 nm and the reverse optical signal ranges from 1,544 nm to 1,554 nm)**.

Regarding claim 8, rejected as stated in claim 7 rejection in which the fourth signal and the second signal are interleaved on separate channels/wavelengths (Joo FIG. 5).

Regarding claim 9, Joo in view of Spock disclose the inline optical amplifier station of claim 1 as applied above.

Joo does not expressly disclose wherein a third bidirectional signal is coupled with the first bidirectional signal in a third optical coupler to produce a fourth bidirectional signal.

Spock teaches wherein a third bidirectional signal is coupled with the first bidirectional signal in a third optical coupler to produce a fourth bidirectional signal **(FIG. 4 (top add/drop channels-62, 64) in which a third bidirectional signal (e.g. add/drop channels) are coupled with the first bidirectional signal to produce a forth bidirectional signal. NOTE: an optical coupler (third optical coupler) is inherently used to couple the add/drop channels)**.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo's amplifier stage and incorporate Spock's teachings of add/drop channels located within the first stage and second stage optical amplifying stations. The motivation being that this allows the system to dynamically add and drop channels. Thereby, allowing the system to dynamically remove or allocate wavelengths based on traffic demands of the network. NOTE: Spock's teachings of separating the bidirectional signal via de-interleaver-48, separately imparting dispersion compensation per path, separately add/dropping channels per path and interleaving the channel again are hereinafter incorporate into Joo's optical amplifying stage (e.g. Spock's configuration from FIG. 4 is incorporate into Joo FIG. 6). The motivation being that this allows the system to add/drop channels and compensate for dispersion separately for an eastbound signal and a westbound signal; thereby, giving the system greater individual control of the east/west-bound signals.

Regarding claim 11, Joo in view of Spock disclose the inline optical amplifier station of claim 9 as applied above.

Spock further discloses wherein a fifth bidirectional signal is combined with the second bidirectional signal in a fourth optical coupler to produce a sixth bidirectional signal **(FIG. 4 (bottom add/drop channels-62, 64) in which a fifth bidirectional signal (e.g. add/drop channels) are coupled with the second bidirectional signal to produce a sixth bidirectional signal. NOTE: an optical coupler (fourth optical coupler) is inherently used to couple the add/drop channels).**

Regarding claim 15, Joo in view of Spock disclose the inline optical amplifier station of claim 9 as applied above.

Spock further discloses comprising a westbound transmitter providing a westbound transmitted signal **(FIG. 4 (64-top add channel) in which a westbound transmitter (top add channel) provides a westbound transmitted signal, e.g. added channel travels west via path-52)**.

Regarding claims 19 and 20, rejected as stated in claim 11 rejection in which a top add channel produces an eastbound transmitted signal and a bottom add channel produces a westbound transmitted signal (Spock FIG. 4 (top/bottom add channels-64)).

Regarding claim 21, Joo in view of Spock disclose the inline optical amplifier station of claim 20 as applied above.

Spock further discloses wherein the eastbound transmitted signal is coupled into the fifth bidirectional signal **(FIG. 4 (64-bottom add channel) in which an add channel is coupled into a fifth bidirectional signal, e.g. coupled into the fifth bidirectional channel by interleaver (37))** and the westbound received signal is decoupled from the fifth bidirectional signal by a fourth optical coupler/decoupler **(FIG. 4 (62-bottom drop channel) in which a westbound signal is decoupled from the fifth bidirectional signal, e.g. dropped/decoupled channel)**.

Regarding claim 22, Joo in view of Spock disclose the inline optical amplifier station of claim 21 as applied above.

Spock further discloses wherein the fifth bidirectional signal and the second bidirectional signal are coupled by a fourth optical coupler into a sixth bidirectional

signal **(FIG. 4 in which the fifth bidirectional signal (bottom add/drop channels-62, 64) and the second bidirectional signal (e.g. input from 32) are coupled by a fourth optical coupler (e.g. interleaver-37) into a sixth bidirectional signal (43))**.

Regarding claim 23, Joo in view of Spock disclose the inline optical amplifier station of claim 4 as applied above.

Joo does not expressly disclose further comprising: an optical decoupler operatively connected to the third variable optical attenuator decoupling the intermediate combined amplified signal into a westbound uncompensated signal and an eastbound uncompensated signal; a first dispersion compensation module operatively connected to the optical decoupler for compensating the eastbound uncompensated signal into an eastbound compensated signal; a second dispersion compensation module operatively connected to the optical decoupler for compensating the westbound uncompensated signal into a westbound compensated signal; and an optical coupler operatively connected to the first dispersion compensated module and the second dispersion compensation module for coupling the eastbound compensation signal and the westbound compensated signal into the intermediate combined amplified signal.

Spock teaches further comprising:

an optical decoupler operatively connected to the third variable optical attenuator decoupling the intermediate combined amplified signal into a westbound uncompensated signal and an eastbound uncompensated signal **(FIG. 4 (48-interleaver) in which the interleaver decouples the intermediate combined amplified signal (46) into a westbound uncompensated signal (bottom signal) and**

an eastbound uncompensated signal (top signal). Spock further teaches in ¶0033, 0039 that the optical attenuators can be placed in a varied of locations, e.g. after the first amplifier (44) (third optical attenuator connected to optical decoupler));

a first dispersion compensation module operatively connected to the optical decoupler for compensating the eastbound uncompensated signal into an eastbound compensated signal **(FIG. 4 (56-first dispersion compensation module) in which the first dispersion compensation module is connected to the interleaver (decoupler) for compensating the eastbound uncompensated signal (e.g. input into 56) into an eastbound compensated signal, e.g output of 56)**;

a second dispersion compensation module operatively connected to the optical decoupler for compensating the westbound uncompensated signal into a westbound compensated signal **(FIG. 4 (58-second dispersion compensation module) in which the second dispersion compensation module is connected to the interleaver (decoupler) for compensating the westbound uncompensated signal (e.g. input into 58) into a westbound compensated signal, e.g output of 58)**; and

an optical coupler operatively connected to the first dispersion compensated module and the second dispersion compensation module for coupling the eastbound compensation signal and the westbound compensated signal into the intermediate combined amplified signal **(FIG. 4 (37-interleaver) in which the interleaver (optical coupler) couples the first and second compensated signals into an intermediate combined amplified signal)**.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo's amplifying station and incorporate Spock's teaching of separately dispersion compensating bidirectional signals. The motivation being that this allows the system to apply the appropriate amount of individual dispersion compensation on the signals; thereby, allowing for the system to individually optimize the dispersion compensation on each signal.

Regarding claim 24, rejected as stated in claim 23 rejection in which the combined amplified signal is modified by an optical element (e.g. optical attenuator) before being decoupled.

Regarding claim 25, Joo in view of Spock disclose the inline optical amplifier station of claim 24 as applied above.

Joo does not expressly disclose wherein the optical element is an optical add/drop multiplexer.

Spock teaches wherein the optical element is an optical add/drop multiplexer **(FIG. 4 (64-add channels, 62-drop channels) in which the add/drop channels get multiplexed/demultiplexed in/out of the signal)**.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo's amplifier stage and incorporate Spock's teachings of add/drop multiplexer. The motivation being that this allows the system to dynamically add and drop channels. Thereby, allowing the system to dynamically remove or allocate wavelengths based on traffic demands of the network. NOTE: Spock's teachings of separating the bidirectional signal via de-interleaver-48, separately imparting dispersion

compensation per path, separately add/dropping channels per path and interleaving the channel again are hereinafter incorporate into Joo's optical amplifying stage (e.g. Spock's configuration from FIG. 4 is incorporate into Joo FIG. 6). The motivation being that this allows the system to add/drop channels and compensate for dispersion separately for an eastbound signal and a westbound signal; thereby, giving the system greater individual control of the east/west-bound signals.

Regarding claim 26, Joo in view of Spock disclose the inline optical amplifier station of claim 24 as applied above.

Joo does not expressly disclose wherein the optical element is a dynamic gain equalizer.

Spock teaches wherein the optical element is a dynamic gain equalizer (**¶0053 in which a variable optical attenuator(s) enables two different effective gains to be achieve which allows for the equalization of the gain in the two signals; thereby, making the variable optical attenuator functionally equivalent to a dynamic gain equalizer)**.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo and incorporate Spock's teachings of a dynamic gain equalizer. The motivation be that this allows the system to control the amount of gain imparted on separate signals; thereby, allowing the system to fine tune the gain of the separate signals in accordance with there individual parameters.

Regarding claim 27, rejected as stated in claim 3 in which there is a first and second stage amplifier.

Regarding claim 28, rejected as stated in claim 26 and 27 rejections.

Regarding claim 29, rejected as stated in claim 25 and 27 rejections

Regarding claim 30, rejected as stated in claim 26 rejection in which a first and second variable optical attenuator are used to equalize the power/gain of the signals.

Regarding claim 31, Joo discloses a method for amplifying an eastbound signal and a westbound signal in a single fiber optical transport system (FIG. 6) comprising the steps of:

isolating a first eastbound signal **(FIG. 6 (515) in which a first eastbound signal is isolated/separate from fiber-800)**;

isolating a first westbound signal **(FIG. 6 (660-optical circulator) in which a first westbound signal is isolated from fiber-800, e.g. output from top of circulator)**;

combining the power matched signals **(FIG. 6 (620-interleaver) in which the signals are combined)**;

amplifying the power matched signals **(FIG. 6 (EDFA) in which the combined signals are amplified via EDFA)**;

isolating a second eastbound signal and isolating a second westbound signal **(FIG. 6 (650-deinterleaver) in which the de-interleaver isolates a second eastbound (e.g. output port 1 of de-interleaver) and a second westbound signal (e.g. output port 2 of de-interleaver))**; and

Joo does not expressly disclose power matching the first eastbound signal and the first westbound signal;

Spock teaches power matching the first eastbound signal and the first westbound signal **(¶0033,0039 in which the variable optical attenuators are placed are various points in the system for the purpose of adjusting the gain of the eastbound and westbound signals-¶0053)**

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo and incorporate Spock's teachings of power matching/attenuating the optical signals. The motivation being that this ensures that the power of the signals input into the optical amplifier are not to high; thereby, preventing damage to the optical amplifier. Furthermore, by equalizing the power of the two signal before they are input into the amplifier, this ensures that minimum amount of gain tilt (e.g. in which one signal gets amplified more than the other).

Regarding claim 32, Joo in view of Spock disclose a method of claim 31 as applied above.

Joo further discloses wherein the step of amplifying further comprises compensating for dispersion **(FIG. 6 (640-dispersion compensation module))**.

Regarding claim 33, rejected as stated in claim 31 in which a variable optical can be placed at the output of the output of the combiner/coupler for attenuating the power matched signal.

Regarding claim 34, Joo in view of Spock disclose the method of claim 32 as applied above and isolating an eastbound power matched signal; isolating a westbound power matched signal and recombining the eastbound power matched signal and the westbound power matched signal.

Joo further discloses wherein the step of compensating for dispersion further comprise the steps of: compensating for the dispersion in the eastbound power matched signal; compensating for the dispersion in the westbound power matched signal **(FIG. 6 (640-dispersion compensation module) in which the DCM compensates for the dispersion of the eastbound and the westbound signals)**;

Furthermore, Spock teaches wherein the step of compensating for dispersion further comprise the steps of: compensating for the dispersion in the eastbound power matched signal; compensating for the dispersion in the westbound power matched signal **(FIG. 4 (dispersion compensators: 56,58) in which the dispersion compensators compensate for dispersion separately, after the eastbound and westbound signals have been isolated)**.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo and incorporate Spock's teaching of separately dispersion compensating an eastbound and westbound signal. The motivation being that this allows the system to apply the appropriate amount of individual dispersion compensation on the signals; thereby, allowing for the system to individually optimize the dispersion compensation on each signal.

Regarding claims 49 and 50, rejected as stated in claim 1 rejection Joo FIG. 6 and Spock FIGs. 2,6.

Regarding claim 51, rejected as stated in claim 31 rejection in which the first eastbound and westbound signals are unamplified (Spock FIG. 6 (515-eastbound signal, output port of circulator 660-westbound signal)) and the second eastbound and

westbound signals are amplified signals (Joo FIG. 6 (output port 1 of interleaver 650-second eastbound amplified signal, output port 2 of interleaver-second westbound amplified signal))

4. **Claims 10, 12-14 and 16-17 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Joo in view of Spock in further view of Maeno (US 7,054,555).

Regarding claim 10, Joo in view of Spock disclose the inline optical amplifier station of claim 9 as applied above.

Joo in view of Spock does not expressly disclose wherein the third bidirectional signal includes an optical service channel.

However, it is well know in the art to use an optical service channel within a WDM system. The motivation being that this allows for control information to be sent on a dedicated channel; thereby, avoiding having to dynamically allocate a channel every time control information needs to be sent. To further illustrate this concept, Maeno reference is provided.

Maeno discloses wherein the third bidirectional signal includes an optical service channel **(FIGs 2,3 in which an in-band service channel (e.g. service channel within channel wavelength band) and an out-band service channel (e.g. service channel outside channel wavelength band) is used)**.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Joo in view of Spock and incorporate Maeno's teaching of including an optical service channel. The motivation being that this allows for control information

to be sent on a dedicated channel; thereby, avoiding having to dynamically allocate a channel every time control information needs to be sent.

Regarding claim 12, rejected as state in claim 10 rejection in which the service channel is outside the channel wavelength range (e.g. out-band service channel).

Regarding claims 13 and 14, rejected as stated in claim 10 rejection in which the third/fourth bidirectional signals (top/bottom add/drop channels) inherently have the capability of adding/dropping the service channel in order to be able to send/receive commands.

Regarding claim 16, Joo in view of Spock in further view of Maeno disclose the inline optical amplifier station of claim 13 as applied above.

Spock further discloses comprising an eastbound receiver for receiving an eastbound received signal **(FIG. 4 (64-bottom add channels) in which a eastbound transmitter (bottom add channel) provides a eastbound transmitted signal, e.g. added channel travels east via path-50)**.

Regarding claim 17, Joo in view of Spock in further view of Maeno disclose the inline optical amplifier station of claim 16 as applied above.

Spock further discloses wherein the westbound transmitted signal is coupled into the third bidirectional signal and the eastbound received signal is decoupled from the third bidirectional signal by a third optical coupler/decoupler **(Fig. 4 (62-drop channels, 64-add channels) in which a westbound transmitted signal (add channel) is couple into the third bidirectional signal and the eastbound received signal (drop channel) is decoupled from the third bidirectional signal. NOTE: an optical**

coupler (third optical coupler/decoupler) is inherently used to couple the add/drop channels).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hawg (US 2001/0038477) in which Hawn discloses a bi-directional WDM optical system with an inline optical amplifier for amplifying bi-directional traffic.

Baker (US 5,452,124) in which Baker discloses an amplification system for bi-directional transmission using WDM.

Meli et al (US 5,995,259) in which Meli discloses a bi-directional optical amplifier for amplifier a bi-directional WDM signal.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis F. Garcia whose telephone number is (571)272-7975. The examiner can normally be reached on 8-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken N. Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LG

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER